

010526 - Malibu Creek Watershed Restoration

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Summary

The U.S. Army Corps of Engineers, the California Department of Parks and Recreation and other stakeholders are studying the Malibu Creek watershed immediately upstream and downstream of Rindge Dam to determine the feasibility of restoring the creek's ecosystem and its associated terrestrial and aquatic habitat, as well as enhancing the wildlife movement corridor within the watershed. The study will also consider the possible beneficial use of sediment removed at Rindge Dam for beach nourishment or other environmental restoration.

Malibu Creek watershed is located in the Santa Monica Mountains about 30 miles west of Los Angeles. A mixture of urban development and open space comprises the 110-square mile watershed that drains into Malibu Lagoon and Santa Monica Bay. About two-thirds of the watershed is in northwest Los Angeles County and about one-third in southeast Ventura County. Residential development, recreational reservoirs and agricultural operations have significantly modified the watershed.

Reconnaissance Study

In 1998, Congress appropriated funds for a Reconnaissance Study to determine whether the federal government had an interest in restoring the Malibu Creek watershed environment and protecting its associated shoreline. The Recon Study determined that a federal interest does exist and recommended participating in a cost-shared study with the California Department of Parks and Recreation, the project's local sponsor to determine the feasibility of ecosystem restoration and watershed management improvements along this reach of Malibu Creek. As a result, the Corps of Engineers and the California Department of Parks and Recreation signed a Feasibility Study Cost Sharing Agreement in July 2001. The federal government and the project's local sponsor will share equally the cost of the Feasibility Study.

Feasibility Study

The Feasibility Study that is now underway will: 1) analyze existing conditions in the watershed and predict future conditions if no project is undertaken; 2) develop and analyze different alternatives to accomplish project goals; and 3) recommend a specific project or plan of action. The Feasibility Study is currently analyzing existing conditions in the project area.

During the feasibility phase, study participants will 1) specify problems and opportunities associated with restoring Malibu Creek ecosystem, 2) inventory current and forecast future conditions in the watershed, 3) formulate alternative plans, 4) evaluate the effects of alternative plans, 5) compare the different alternative plans, and 6) select a recommended plan. These steps are iterative and continue throughout the development of the feasibility study.

The planning objectives defined by the study team and participating stakeholders, directly address water and related land resources management practices. These planning objectives were to:

- * Reconnect the terrestrial and aquatic movement corridors for desirable aquatic and terrestrial species within the Malibu Creek watershed ecosystem.
- * Restore access to spawning and rearing habitat for the southern steelhead above the current location of Rindge Dam.
- * Maintain or improve water quality.
- * Hold flooding risks downstream of dam at current levels. Do not worsen the potential for flooding.
- * Use excavated sediment beneficially.
- * Improve educational, recreational, and aesthetic opportunities associated with Malibu Creek and the Rindge Dam site.

Environmental Restoration

Corridors function to prevent habitat fragmentation that would result in the loss of area-sensitive species (species that require large contiguous expanses of unbroken habitat) and the loss of large animals that have extensive home ranges and that normally occur in low densities, such as mountain lions. Habitat fragmentation may cause increases in the number of highly adaptable non-native species and favors those that are normally common, and may cause inbreeding to occur in species whose populations are small because they have become confined to smaller areas. This results in lowering the rate of reproductive success. Corridors promote gene flow, allow recolonization after disturbance (such as fire or flooding), prevent the loss of large animals by linking suitable habitat areas and help ensure the survival of native species that cannot compete with more aggressive non-native species in fragmented habitats.

Fragmentation can be equally as damaging as habitat destruction because it reduces functioning ecosystems to scattered pockets of habitat stripped of their essential interactive processes. These pockets tend to decrease

substantially in biodiversity over time because small, isolated populations often become locally extinct in the absence of recruits from other areas.

Malibu Creek is a major drainage that connects coastal regions of Los Angeles County with interior regions of Los Angeles and Ventura counties. As such, Malibu Creek is an important regional corridor linking riparian ecosystems from the immediate coastal plain with the interior plains and valleys of the region. The 109 square mile study area, including government managed lands by National Park Service, California State Parks, and Los Angeles County Parks, with its extensive non-developed areas, provides a wealth of biological resources.

Cultural Resources

Archeological data indicate that occupation of the California south-central coast dates to at least 9,500 years before present (B.P.), and in some places as early as 13,000 B.P. (Santa Rosa Island). The Gabrielino/Tongva established large permanent villages in the fertile lowlands along rivers and streams and in sheltered areas along the coast, developing a highly effective maritime subsistence pattern comprised of exploitation of fish, shellfish, sea mammals, and waterfowl.

Chumash villages, also known as rancherias, were usually situated near the confluence of several watercourses and/or habitats.

During the Mexican Period, large Mexican land grants, followed by Spanish ranchos dominated the region. The project area was sandwiched between the Rancho Las Virgenes on the north and Rancho Topanga Malibu Sequit to the south.

May K. Rindge and her husband, Frederick Hastings Rindge purchased the majority of what was once the Rancho Topanga Malibu Sequit in 1891. The Rindges established a working cattle ranch, grew a variety of fruits and vegetables, and built a large house in Malibu Canyon. The Rindge Dam, built at the request of May K. Rindge, is within the project area.

Rindge Dam is a constant-radius arch dam originally designed and constructed to impound water in the reservoir created upstream of the structure. It is located on Malibu Creek, about three miles upstream from the Pacific Ocean. The Rindge family built the dam between April 1924 and January 1926 to provide water storage for agricultural needs. Rindge Dam represents one of only a handful of concrete, constant-radius arch dams constructed in the western United States before 1930. Rindge Dam generally retains sufficient historical significance and integrity to be considered potentially eligible for listing in the NRHP.

Sediment carried by Malibu Creek deposited behind the dam until it lost its function as a water storage reservoir in the early 1960s. The dam was decommissioned in 1967 and is now owned and managed as part of Malibu Creek State Park. The reservoir behind the dam is entirely filled with sediment. Of the approximately 780,000 cubic yards of sediment trapped behind the dam, approximately one-third of that sediment appears suitable to replenish nearby beaches.

Endangered Species

The Santa Monica Mountains supports a remarkably abundant wildlife community considering its close proximity to one of the largest urban areas of the United States. The Santa Monica Mountains are reported to support over 450 vertebrate species, including 50 mammals, 384 species of birds, and 36 reptiles and amphibians.

The vegetation in the study area provides for a variety of habitat types, including sensitive riparian and emergent wetland habitats. Riparian and emergent wetlands occur throughout the Creek and provide wildlife with shade, protection from predators, foraging habitat, nesting, and breeding habitat. The upland vegetation communities that occur within and adjacent to the project (e.g., annual grassland and oak savannah) support a wide variety of species, and contribute to the overall wildlife species diversity.

Plant and animal species are designated as sensitive because of their overall rarity, endangerment, unique habitat requirements, and/or restricted distribution as defined by the USFWS. In general, it is a combination of these factors that leads to a sensitivity designation. Sensitive species include those listed by the USFWS, CDFG, and the California Native Plant Society (CNPS). The CNPS listing is sanctioned by the CDFG and essentially serves as its list of "candidate" species for threatened or endangered species.

No Federal or State of California listed endangered or threatened plant species were identified within the project area. Due to the extensive plant surveys that occurred, there is a low potential that any of these species occur within the project area. The National Park Service has identified 84 rare, sensitive, Threatened, or Endangered vertebrate animals that occur or potentially could occur in the entire Santa Monica Mountains. For the Malibu watershed, the Malibu Creek Watershed Plan identified about 40 such species.

Steelhead (*Oncorhynchus mykiss*) are ocean-going forms of rainbow trout that are native to Pacific coast streams from Alaska south to northwestern Mexico. In California, six populations of steelhead have been determined to be evolutionary significant units (ESUs) and are federally listed at this time. The population of steelhead in the southern California ESU is

federally endangered and has adapted to survive the semi-arid climates and the rainfall pattern of southern California. The population is currently known from San Luis Obispo County south to San Mateo Creek watershed in San Diego County.

Currently, the 3-mile stretch of Malibu Creek below Rindge Dam is suitable steelhead habitat. Good quality habitat is located below the dam. Above Rindge Dam it is estimated that 5.93 miles of good to excellent steelhead habitat are currently inaccessible to steelhead and other aquatic species as a result of the impassible barrier created by the dam. Historical records show that runs within Malibu Creek have been estimated as high as 1,000 steelhead, where the population is currently estimated in the dozens. The National Marine Fisheries Service has concluded that historically the currently inaccessible habitat above the dam provided the principal spawning and rearing habitat for steelhead within the Malibu Creek watershed.

Map and Location

Sponsor

California Department of Parks and Recreation
Malibu Creek State Park

Related Links

Heal the Bay
National Park Service & Santa Monica Mountains National Recreation Area
Resource Conservation District of Santa Monica Mountains
Santa Monica Bay Restoration Commission
Santa Monica Mountains Conservancy

News Releases/Media Info

FAQs/Public Opinion/Comments

Q. How will the project affect restoration of steelhead habitat?

A. Restoration of steelhead habitat may require the removal of physical barriers as well as an improvement in water quality. Removal of Rindge Dam could provide steelhead access to suitable spawning and rearing habitat upstream of the dam. Improvements to water quality within Malibu Creek (reduced temperatures, increased dissolved oxygen levels, among others) could reduce environmental stresses on steelhead and potentially improve breeding and survival rates.

Q. What effects will the project have on water quality in Malibu Creek?

A. The effects of water quality on the success of steelhead habitat restoration will be evaluated during the study. Specific water quality parameters to steelhead success including, among others, temperature, dissolved oxygen levels, and water velocity will be considered. Specific actions to improve water quality, when warranted, will be evaluated and discussed in the study.

Q. How would removing Rindge Dam affect flood control along Malibu Creek?

A. Rindge Dam has completely filled with sediment; it provides no flood control. During peak events, the entire flow of Malibu Creek cascades over the top crest. For smaller flood events, water flows over the spillway and drops approximately 90 feet to the natural elevation of Malibu Creek. The existing conditions indicate that the dam does not provide any flood control benefits; therefore, it is unlikely that removal of this dam will worsen the existing flood threat. However, even though the study is focused on environmental restoration and not flood damage reduction, the Corps will examine the potential downstream impacts of all alternatives and develop measures to ensure the project will not worsen the downstream effects of flooding beyond those currently existing.

Q. How will the project affect water supply along Malibu Creek?

A. The project will not affect water supply along Malibu Creek or in the City of Malibu. The former Rindge Dam reservoir has not been used for water supply since the 1960s. The existing conditions indicate that there is no water storage available behind Rindge Dam. Further, the dam is no longer managed to hold water and extensive structural evaluations of the dam's stability would be required before any such use could be undertaken. This option is outside the current management plans of the Malibu Creek State Park.

Q. Could the project cause Malibu Creek's banks to erode?

A. The potential for bank erosion and landslides exists throughout the project area under current conditions regardless of the outcome of this study or the implementation of any project alternative that might be selected in the future. It is possible that the sediment behind the dam has served to stabilize the area of the reservoir itself, though the canyon in that area is incised to the point that much bedrock is exposed. It is also likely that the collection of sediment behind the

dam reduced the sediment flow downstream, thereby increasing the erosive force of the creek downstream of the dam's location. The possibility of an increased erosion hazard will be investigated during the course of the study.

Q. What effects will the project have on beach nourishment?

A. There may be potential beneficial uses of the accumulated sediment (behind the dam) to nourish downstream beaches and protect development from coastal storm damage.

Q. Why has sediment collected behind Rindge Dam?

A. Rindge Dam created an obstruction along Malibu Creek, trapping the sediment behind the dam. Since no one maintained the dam, sediment accumulated to the crest of this structure. The dam was decommissioned as a water supply reservoir in 1967. It is currently part of Malibu Creek State Park.

Q. What effects will the project have on cultural resources in the area?

A. In addition to Native American cultural resources in the area, the project will evaluate historic resources, including Rindge Dam. The feasibility study includes such evaluation.

Schedule

2006: Analyze alternatives; produce Draft Feasibility Report

2007: Forward Draft Feasibility Report for approval; Public Notice

Photos

Contact

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